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TECHNICAL MEMORANDUM

TO: **Will Ernst, Mike Gleason (Boeing)** **Date: March 27, 2007**

FR: **Ian Young (Golder)** **Job No.: 013-1646.003.400**

RE: **Boeing Plant 2, Building 2-122 Line Equipment Foundation and Sump Excavation, Post-Excavation Sampling Results**

Boeing completed the construction of structures related to a new tank line inside Building 2-122 at Plant 2. Excavations for numerous equipment footings and sumps were required for these features in the west portion of the building, as indicated on Figure 1. This memorandum presents the results of post excavation soil sampling conducted within the excavation areas during April 2006.

Boeing removed concrete and excavated soil to accommodate foundation construction and installation of tank sumps. Figure 1 shows the various excavation and sample locations. None of the excavations associated with the tank line foundations and sumps are adjacent to, downgradient from, or within the extent of any identified RCRA units at Plant 2. Golder monitored air for volatile organic vapors in the excavation zone with a photo-ionization detector (PID) to insure safe working conditions in accordance with health and safety standards.

This memorandum presents analytical results for soil samples collected subsequent to the removal of surface concrete and excavation of soil in the construction locations. Sampling was conducted to monitor health and safety and to characterize soil for disposal or reuse. Soil samples were collected from completed excavations at three locations using grab sample methods. Soil samples were collected as outlined in the December 16, 2005 Technical Memorandum and in general accordance with the Plant 2 *Compendium of Sampling and Analysis Plans and Quality Assurance Project Plans for Boeing Plant 2 Seattle* (Golder, 2004). No samples were collected within the boundaries of a RCRA unit.

Soil samples were analyzed for volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), PCBs and metals. Table 1 presents results for those constituents of concern (COCs) detected above reporting levels for each of the soil samples. Constituent concentrations exceeding the 1999 Plant 2 PMCLs (Weston, 1999) are shown in bold fonts, and constituent concentrations exceeding the 2004 screening levels are shaded.

The results show that PCBs were the only COCs detected above PMCLs and/or screening levels in only one sample. At location PL2C-2-122-OU, PCB Aroclor 1248 (40 µg/kg) and Aroclor 1254 (42 µg/kg) were detected above their respective PMCLs and screening level of 33 µg/kg in the sample collected 3.0 feet below ground surface (bgs). No other constituents exceeded either their respective PMCLs or screening levels.

All samples are representative of bottom or sidewall soil left *in situ* in each of the excavations. Soils in most areas were excavated to depths of approximately 2 ft bgs to support foundation structures. Deeper excavations for a variety of sumps were dug to depths from between 4 ft and 5.5 ft bgs in the

vicinities of column lines D3, J5, and J3. The most prominent excavation occurred in the vicinity of column lines E5 and E6, which was excavated to a final depth of 7.5 ft bgs. Groundwater was encountered in this excavation at a depth of approximately 6.5 ft bgs. No groundwater samples were collected. Soil samples PL2C-2-122-OS-0030 and PL2C-2-122-OS-0055 were collected from the east wall of the excavation at depths of 3 to 3.5 ft bgs and 5.5 to 6 ft bgs, respectively.

Excavated soils from the excavations were stockpiled and segregated with concrete blocks and plastic sheeting in a discrete stockpile (Stockpile C) on the Building 2-65 slab. Stockpiled soils will be evaluated by Boeing and will be disposed of or reused at their discretion.

References

Roy F. Weston, Inc. *Technical Memorandum Appropriateness Evaluation Corrective Measures Study Boeing Plant 2*, March 1999.

Golder Associates Inc. *Compendium of Sampling and Analysis Plans and Quality Assurance Project Plans for Boeing Plant 2 Seattle/Tukwila, Washington.* August 2004.

Golder Associates Inc. Technical Memorandum: *Boeing Plant 2, Tank Line Equipment Foundation and Sump Excavation EvaluAtion.* December 16, 2005.

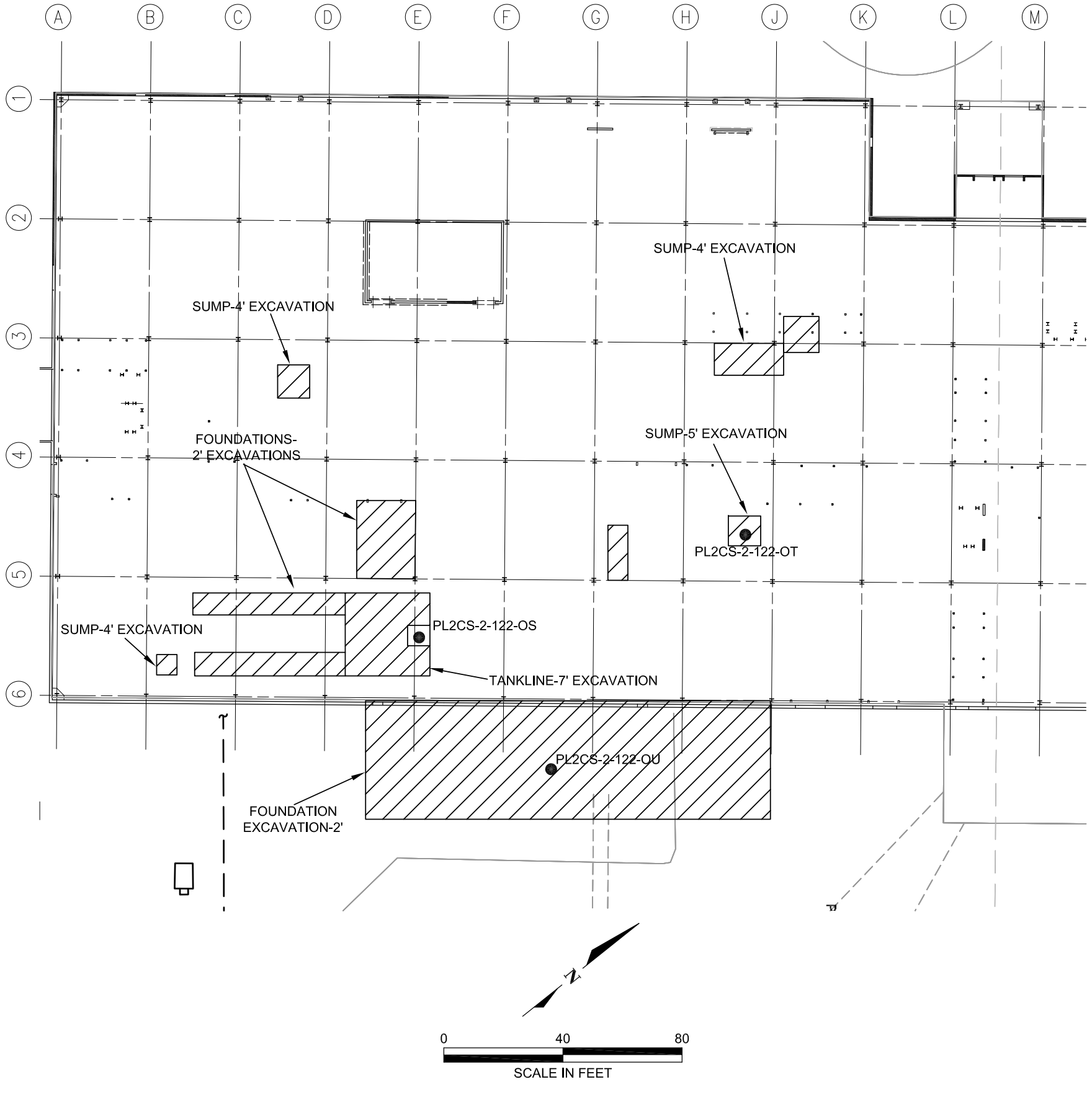
cc: K. Angelos (Golder)

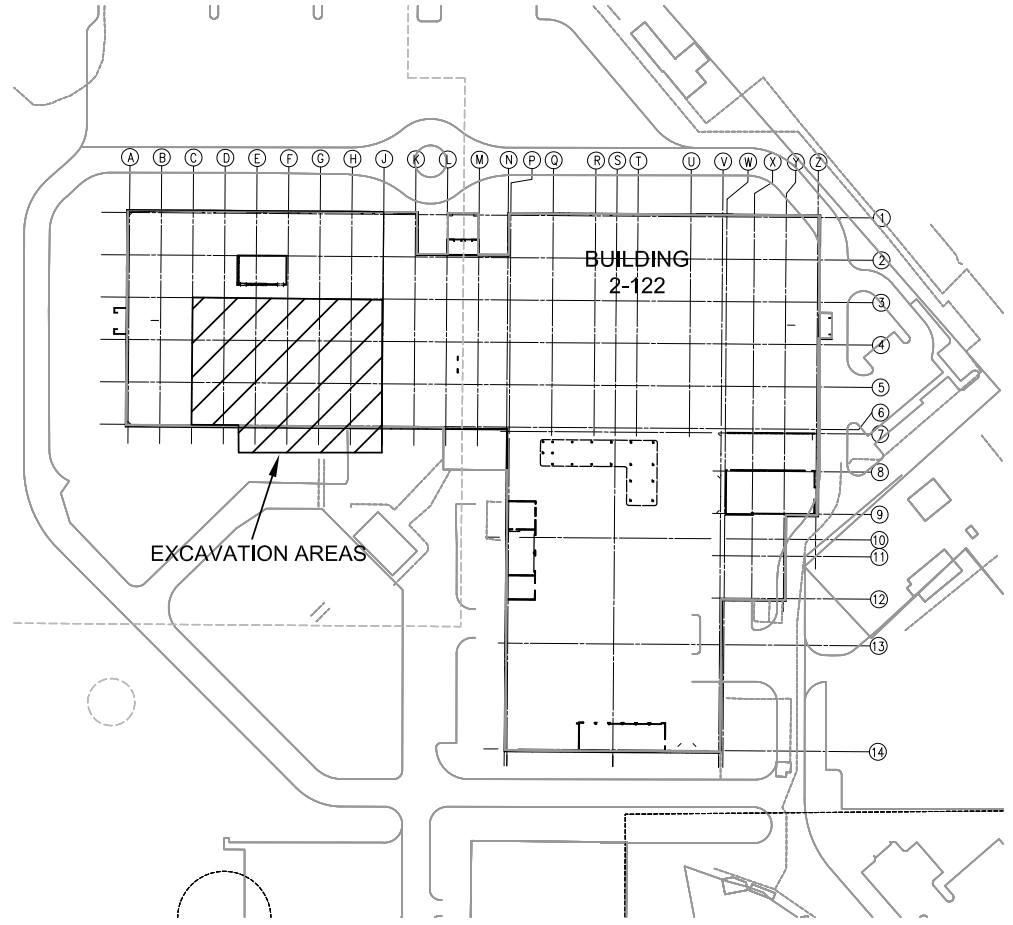
Attachments: Table 1
Figure 1

Detected Constituents in Soil
Building 2-122 Tankline Foundation and Sump - Construction Sampling
Boeing Plant 2

Parameter	Analytical Method	2004 Soil Screening Level	1999 PMCL	North Yard Area PL2CS-2-122-OS-0030 3 - 3.25 4/10/2006	North Yard Area PL2CS-2-122-OS-0055 5.5 - 5.75 4/10/2006	North Yard Area PL2CS-2-122-OT-0035 3.5 - 3.75 4/14/2006	North Yard Area PL2CS-2-122-OU-0030 3 - 3.25 4/18/2006
VOCs (µg/kg)							
2-Butanone	EPA 8260B	802000	--	5.5 U	5.4 U	5.3 U	9.1
Acetone	EPA 8260B	355000	255285800	5.5 U	5.4 U	5.3 U	49
PCBs (µg/kg)							
Aroclor 1016	EPA 8082	--	--	32 U	32 U	33 U	32 U
Aroclor 1221	EPA 8082	--	--	32 U	32 U	33 U	32 U
Aroclor 1232	EPA 8082	--	--	32 U	32 U	33 U	32 U
Aroclor 1242	EPA 8082	33	33	32 U	32 U	33 U	32 U
Aroclor 1248	EPA 8082	33	33	32 U	32 U	33 U	**40**
Aroclor 1254	EPA 8082	33	33	32 U	32 U	33 U	**42**
Aroclor 1260	EPA 8082	33	33	32 U	32 U	33 U	32 U
Aroclor 1262	EPA 8082	--	33	32 U	32 U	33 U	32 U
Aroclor 1268	EPA 8082	--	--	32 U	32 U	33 U	32 U
Total PCB	EPA 8082	33	33	32 U	32 U	33 U	**82**
Metals and Cyanide (mg/kg)							
Aluminum	EPA 6010B	--	32581	9050	10800	7540	9370
Antimony	EPA 6010B	464	425	5 U	5 U	5 U	5 U
Arsenic	EPA 6010B	7.3	7.3	5 U	5	5 U	5 U
Barium	EPA 6010B	93300	--	32.4	30.9	25.2	34.4
Beryllium	EPA 6010B	222	0.6	0.1	0.2	0.1	0.1
Cadmium	EPA 6010B	1.21	1.28	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	EPA 6010B	--	1000	13.6	24.9	9.6	23.1
Cobalt	EPA 6010B	--	--	4.7	6.5	4.2	5.1
Copper	EPA 6010B	36.4	36.4	14.1	15.7	11.7	16.7
Iron	EPA 6010B	--	--	12300	14800	11300	14300
Lead	EPA 6010B	1000	400	8	6	5	8
Magnesium	EPA 6010B	--	--	2800	5310	2200	4190
Manganese	EPA 6010B	1146	1146	121	240	106	208
Mercury	EPA 7471A	0.07	0.07	0.04 U	0.05 U	0.05 U	0.05 U
Molybdenum	EPA 6010B	6670	--	0.5 U	0.5 U	0.5 U	0.5 U
Nickel	EPA 6010B	47.8	38.2	12	31	8	22
Selenium	EPA 6010B	7.38	7.3	5 U	5 U	5 U	5 U
Silver	EPA 6010B	0.323	0.3	0.3 U	0.3 U	0.3 U	0.3 U
Thallium	EPA 7841	0.669	8.9	0.1 U	0.1 U	0.1 U	0.2
Tin	EPA 6010B	800000	--	1 U	1 U	1 U	1 U
Vanadium	EPA 6010B	9330	13000	43.3	39	40	39.4
Zinc	EPA 6010B	101	107	34.5	34.3	28.2	40.2
Petroleum Hydrocarbons (mg/kg)							
TPH - Motor Oil Range	NWTPH-HCID	2000	200	100 U	100 U	110 U	>100
TPH - Diesel Range	NWTPH-Dx-Cleaned	2000	200				8
TPH - Motor Oil Range	NWTPH-Dx-Cleaned	2000	200				38

Notes:
Shading indicates concentration exceeds 2004 Soil Screening Level.
Bold indicates concentration exceeds PMCL.





LOCATION MAP
NOT TO SCALE

LEGEND
PL2CS-2-122-OS
SAMPLING LOCATIONS
EXCAVATION

FIGURE **1**

BUILDING 2-122 TANKLINE EXCAVATION MAP
SAMPLE LOCATIONS
BOEING/PLANT 2 CMS/WA

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